What is claimed is:

1. A method for inducing an immune response to a transgene product in a subject pre-exposed to an adenovirus or adenoviral vector comprising orally administering to a subject, that has been exposed to a first adenovirus or adenoviral vector, an effective amount of a second adenoviral vector encoding a transgene product so that an immune response to the transgene product is induced.

2. The method of claim 1, wherein the first adenoviral vector and the second adenoviral vector encode the same transgene product.

3. The method of claim 1, wherein the first adenoviral vector and the second adenoviral vector encode different transgene products.

4. The method of claim 1, wherein the transgene product is an antigenic epitope or protein from a cancer cell, virus, fungus, bacterium, protozoa, mycoplasma or aberrant protein.

5. The method of claim 1, wherein the first adenovirus is a wild-type virus and the second adenovirus comprises a vaccine.

6. The method of claim 1, wherein the first adenoviral vector and the second adenoviral vector comprise a vaccine.

7. The method of claim 5, wherein the second adenoviral vector further encodes an adjuvant.

8. The method of claim 6, wherein the first adenoviral vector or second adenoviral vector further encode an adjuvant.

9. A method for inducing an immune response to a transgene product comprising orally administering to a subject an effective amount of a first adenoviral vector encoding a transgene product and subsequently systemically administering to the subject an effective amount of a second adenoviral vector encoding said transgene product.

10. The method of claim 9, wherein the transgene product is an antigenic epitope or protein from a cancer cell, virus, fungus, bacterium, protozoa, mycoplasma or aberrant protein.

11. The method of claim 9, wherein the first and second adenoviral vector comprise a vaccine.

12. The method of claim 11, wherein the first or second adenoviral vector further encode an adjuvant.

13. A method for inducing an immune response in an infant comprising orally administering to an infant an effective amount of an adenoviral vector encoding a transgene product so that an immune response to the transgene product is induced.

14. The method of claim 13, wherein the transgene product is an antigenic epitope or protein from a virus, fungus, bacterium, protozoa, mycoplasma or aberrant protein.

15. The method of claim 13, wherein the adenoviral vector comprises a vaccine.

16. The method of claim 15, wherein the adenoviral vector further encodes an adjuvant.

17. A method for inducing a mucosal immune response to an antigen comprising:

orally administering an effective amount of a first adenoviral vector containing nucleic acid sequences encoding an antigen, and

orally administering an effective amount of a second adenoviral vector containing said nucleic acid sequences encoding said antigen,

so that a mucosal immune response is induced.

18. The method of claim 17, wherein the first adenoviral vector and the second adenoviral vector encode the same transgene product.

19. The method of claim 17, wherein the first adenoviral vector and the second adenoviral vector encode different transgene products.

20. The method of claim 17, wherein the antigen is from a cancer cell, virus, fungus, bacterium, protozoa, mycoplasma or aberrant protein.

21. The method of claim 17, wherein the first adenoviral vector and second adenoviral vector comprise a vaccine.

22. The method of claim 19, wherein the first or second adenoviral vector further encode an adjuvant.